

WHAT IS CLAIMED IS:

1. A polishing slurry for CMP of Cu, which comprises:

5 a first complexing agent containing a heterocyclic compound which is capable of forming a water-insoluble complex with Cu; and

10 a second complexing agent containing a heterocyclic compound which is capable of forming a slightly water-soluble or water-soluble complex with Cu to thereby provide at least one extra ligand subsequent to formation of the complex.

15 2. The polishing slurry for CMP of Cu according to claim 1, wherein a mixing ratio of said first complexing agent to said second complexing agent is within the range of 2:8 to 8:2 based on weight.

3. The polishing slurry for CMP of Cu according to claim 1, wherein a mixing ratio of said first complexing agent to said second complexing agent is within the range of 4:6 to 6:4 based on weight.

20 4. The polishing slurry for CMP of Cu according to claim 1, wherein said first complexing agent is at least one selected from the group consisting of quinaldinic acid and benzotriazole.

25 5. The polishing slurry for CMP of Cu according to claim 1, wherein said second complexing agent is at least one acid selected from the group consisting of quinolinic acid, nicotinic acid, cinchomeric acid and

pyridine-2,3,4-dicarboxylic acid.

5 6. The polishing slurry for CMP of Cu according to claim 1, wherein said first complexing agent is quinaldinic acid, and said second complexing agent is quinolinic acid, said quinaldinic acid being mixed with said quinolinic acid at a mixing ratio ranging from 4:6 to 6:4 based on weight.

10 7. The polishing slurry for CMP of Cu according to claim 1, which further comprises an oxidizing agent selected from the group consisting of persulfuric acid, ammonium persulfate and hydrogen peroxide.

15 8. The polishing slurry for CMP of Cu according to claim 1, which further comprises polishing particles comprising a material selected from the group consisting of silica, alumina, zirconia and ceria.

9. The polishing slurry for CMP of Cu according to claim 1, which further comprises a polishing rate promoting agent selected from the group consisting of glycine and alanine.

20 10. The polishing slurry for CMP of Cu according to claim 1, which further comprises a surfactant.

11. A method of manufacturing a semiconductor device, which comprises:

25 forming a groove and/or a hole in an insulating film formed above a surface of a substrate;

 depositing a copper film above a surface of said insulating film to thereby bury said groove and/or said

hole with said copper film; and

polishing said copper film by making use of a
polishing slurry comprising a first complexing agent
containing a heterocyclic compound which is capable of
forming a water-insoluble complex with Cu; and a second
5 complexing agent containing a heterocyclic compound
which is capable of forming a slightly water-soluble or
water-soluble complex with Cu to thereby provide at
least one extra ligand subsequent to formation of the
10 complex, thereby filling said groove and/or said hole
with said copper film and removing the portion of said
copper film which is deposited on said insulating film
formed outside of said groove and/or hole.

12. The method according to claim 11, wherein a
15 mixing ratio of said first complexing agent to said
second complexing agent is within the range of 2:8 to
8:2 based on weight.

13. The method according to claim 11, wherein a
mixing ratio of said first complexing agent to said
20 second complexing agent is within the range of 4:6 to
6:4 based on weight.

14. The method according to claim 11, wherein said
first complexing agent is at least one selected from
the group consisting of quinaldinic acid and
25 benzotriazole.

15. The method according to claim 11, wherein said
second complexing agent is at least one acid selected

from the group consisting of quinolinic acid, nicotinic acid, cinchomeric acid and pyridine-2,3,4-dicarboxylic acid.

5 16. The method according to claim 11, wherein said first complexing agent is quinaldinic acid, and said second complexing agent is quinolinic acid, said quinaldinic acid being mixed with said quinolinic acid at a mixing ratio ranging from 4:6 to 6:4 based on weight.

10 17. The method according to claim 11, wherein said polishing slurry further comprises an oxidizing agent selected from the group consisting of persulfuric acid, ammonium persulfate and hydrogen peroxide.

15 18. The method according to claim 11, wherein said polishing slurry further comprises polishing particles comprising a material selected from the group consisting of silica, alumina, zirconia and ceria.

20 19. The method according to claim 11, wherein said polishing slurry further comprises a polishing rate promoting agent selected from the group consisting of glycine and alanine.

20. The method according to claim 11, wherein said polishing slurry further comprises a surfactant.